CHAPTER 6

MITIGATION

CHAPTER SUMMARY: This chapter outlines the process that would be developed to avoid, reduce, and minimize the potential environmental impacts from the proposed Runway Safety Area (RSA) improvement project at the Airport.

6.1 Summary of the Preferred Alternatives

The Federal Aviation Administration (FAA) has identified preferred alternatives for improvements to runway safety areas on two Kodiak Airport runways. The identified preferred alternatives are as follows:

- *Runway 07/25 - Alternative 2*. This alternative would improve the runway safety area on the primary, east-west runway by placing fill into marine waters east of Runway end 25. A 600-foot long RSA would be constructed that includes an Engineered Materials Arresting System (EMAS) bed measuring 340 feet long by 170 feet wide.
- *Runway 18/36 – Alternative 7.* This alternative would improve the runway safety areas on both ends of the north-south Runway 18/36. At the north, Runway end 18, no additional disturbance would occur beyond the current airport boundary but an EMAS bed measuring about 155 feet long by 170 feet wide would be installed on the existing pavement. At the south, Runway end 36, the runway would be shifted 240 feet further south, and a 360-foot RSA would be constructed, for a combined 600 linear feet of new fill beyond the existing runway threshold.

Chapter 4, *Environmental Consequences*, describes the adverse and beneficial environmental impacts that would result from implementing the proposed RSA improvement project. **Table 6-1** at the end of this chapter summarizes the predicted impacts for the preferred alternatives.

6.2 Description of Mitigation Process

"Mitigation" is the process used to avoid, minimize, and compensate for unavoidable environmental impacts of an action. Steps in this process typically include methods to avoid an impact altogether if possible, and then minimize or reduce the magnitude of impact to the extent practicable. These types of mitigation can be included in an action proposed by a sponsor, such as the Alaska Department of Transportation and Public Facilities (ADOT&PF), or incorporated into a project design as part of the regulatory approval process. Two other types of mitigation, rehabilitation (i.e., fixing or correcting an impact at a later time) and compensation are also important to consider. However, these are methods of mitigation considered only for those impacts that cannot be avoided or those that remain after project implementation.

The Council on Environmental Quality regulations implementing the National Environmental Policy Act (NEPA) stipulate that the Environmental Impact Statement (EIS) must include "appropriate mitigation measures not already included in the proposed action or alternatives" (40 CFR § 1502.14(f)). Federal and State agencies involved in consultation and coordination regarding the proposed Kodiak Airport project have specific authority to ensure that any required mitigation measures are adopted and implemented. For example, guidelines implementing Section 404(b)(1) of the Clean Water Act require that all practicable measures are taken to reduce impacts that would be caused by proposed discharges of dredged or fill material into the aquatic environment (40 CFR Part 230). Similarly, Section 4(f) of the Department of Transportation Act (codified as 49 U.S.C. § 303(c)) requires minimization of harm from use of properties protected by that statute.

6.3 Mitigation Sequencing

The Council on Environmental Quality regulation implementing NEPA procedures (40 CFR § 1508.20) has defined mitigation to include:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

6.4 Other Requirements Relevant to Mitigation

Other permitting or consultation processes are also relevant to mitigation.

For the Kodiak Airport RSA improvements, these relevant permits and consultations may include:

- *Section 7 of the Endangered Species Act*. Draft Biological Assessments (BAs) have been prepared and submitted to U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) that document potential impacts to protected species including Northern sea otter, Steller's sea lion, Stellers Eider, and other marine mammals. The BAs include proposed *conservation measures* for avoiding or limiting impacts, species monitoring protocols, and reporting and training requirements. Mitigations and Best Management Practices (BMPs) included in Section 6.5 are consistent with the proposed conservation measures.
- *Essential Fish Habitat (EFH) as defined in the Magnusen-Stevens Fishery Management Act* refers to habitat that is essential to the long-term survival and health of our nation's fisheries, as designated by the NMFS. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." An assessment of potential impacts to EFH and the species that use EFH has been prepared and submitted to NMFS. Opportunities to reduce or minimize EFH impacts are included within the assessment and consistent with the mitigation measures identified in Section 6.5.
- *ANILCA Title XI Right of Way Permit*. As described in **Section 4.24, *ANILCA***, the Coast Guard along with USFWS and other federal agencies will consider an application from ADOT&PF to use submerged lands of the Alaska Maritime National Wildlife Refuge for a transportation system (i.e., the RSA would be considered a component of the Airport's transportation system). The USFWS, in particular, may recommend specific permit conditions to protect fish, marine habitat, and other wildlife and resources of the Refuge.
- *Title 41 of the Alaska Fishway Act Permit*. A permit may be required from Alaska Department of Fish and Game (ADF&G). The Fishway Act (AS 16.05.841) requires that an individual or government agency notify and obtain authorization from the ADF&G for activities within or across a stream used by fish if the department determines that such uses or activities could represent an impediment to the efficient passage of fish. This Act would apply to RSA construction at Runway end 18, but would be avoided with the implementation of Runway 18/36 Alternative 7.

6.5 Description of Mitigation Measures

This section is divided into two subsections. The first identifies mitigation measures that may be used to reduce or minimize environmental impacts, while the second identifies BMPs used during construction. These are potential mitigation measures which will be discussed by the FAA, Sponsor, Federal, State, and Local agencies, and Tribal organizations to evaluate necessary measures, refine the list and finalize for implementation during design and finalized prior to any construction being initiated.

Measures to Reduce or Minimize Environmental Impacts. The preferred RSA alternatives would not completely avoid long-term environmental adverse impacts to some resources. For example, Alternative 2 for Runway 07/25 would not extend as far into marine waters and affect less habitat than would Runway 07/25 Alternative 3, but some habitat would unavoidably be lost and freshwater influence south of the runway end would be reduced considerably. Alternative 7 for Runway 18/36 would completely avoid impacts to higher value habitat of the Buskin River estuary north of the runway, but at the expense of some lesser-value habitat in marine waters south of the runway. There would also be short-term, adverse impacts during construction. All potential environmental impacts for the two Preferred Alternatives are summarized in **Table 6-1**. Nevertheless, the FAA's preferred alternatives represent the greatest mitigation opportunities to avoid or minimize long-term, adverse impacts to fisheries, subsistence, marine habitat, and other natural resources, while still meeting the project purpose and need (see **Chapter 1, *Purpose and Need***).

There are other mitigation measures and design features that may be incorporated into the preferred alternatives to further reduce or minimize environmental impacts. A number of these, identified below, were developed during preparation of this EIS and in consultation with representatives from permitting and consulting agencies. Use of these or similar measures would ensure potential construction impacts are minimized to the extent practical.

- Use of observers during construction activities to limit or halt work when specific species are within defined boundaries. Observer protocols, including observation period timing and reporting requirements, observer vantage locations, training, and other conditions would be consistent with conservation measures recommended by other agencies and accepted by the FAA and ADOT&PF for protection of special status species. Conservation measures for ESA species are described in the Biological Assessment Appendix.
- Limiting project-related barge speed in the Landscape Area, Project Area, and other sensitive areas (such as sea lion haul-outs) to reduce the potential for marine mammal collisions and increase potential survival should a collision occur.

- Avoiding the Cliff Point-Cliff Island-Zaimka Island area by barges hauling fill gravel, underlayer stone, and/or armor stone to the site during the winter. This area is heavily used by Steller's Eider and Emperor Goose and may provide important habitat for individuals displaced from the Airport area during construction.
- Material barges would not be grounded in high-density kelp stands, which can be important foraging habitat.
- Placement of fill and other in-water noise production would occur only after all other noise-generating activities have ramped up and animals have had the opportunity to leave the area of their own accord.
- Fill placement would not occur when viewing conditions make it impossible to monitor the applicable distances. During periods of low visibility, work may continue if additional observers (stationed in boats, for example) can be added to provide complete visual coverage of the area.
- Should a sea otter or sea lion be observed within 300 meters of the project fill footprint prior to filling activities, Engineer notification and work initiation/ramp up/stop procedures would be followed in accordance with accepted conservation measures.
- Construction Timing:
    - Conducting upland vegetation clearing from September through March to avoid impacts to waterbirds (primarily dabblers and shorebirds) that may nest in these areas (USFWS 2007).
    - Scheduling in-water construction work to avoid times when most vulnerable species are most likely be present.
    - During the months of October through April, observers would inform the Engineer if a listed or candidate bird is within 300 meters of fill placement activities. If so, the work would be delayed until the bird or birds have moved out of the area on their own. This distance is based on the behavioral threshold for Steller's eider.
- Crane booms would be left unlit or be lit only with acceptable lighting, and would be lowered as close to ground level as feasible when not in use
- If used, lights would be flashing red. Steady lights would not be used to make cranes or other overhead structures more visible. Only strobe, strobe-like, or blinking incandescent lights would be used for this purpose.
- If ground lighting is needed for work areas within 1/2 mile of the coast, lighting would be kept to the minimum level needed for safety and security.
- Construction lighting would be deployed and directed in such a way as to minimize light and glare for residential areas with clear sightlines to the Airport.

- Minimize in-water construction near the mouth of the Buskin River during critical subsistence harvest periods (typically late-June/early-July).
- Pre-construction raptor nest surveys would take place within 0.5-mile of the Project Area. If Bald Eagle nests are found during that survey, the *National Bald Eagle Management Guidelines* would be followed. Specifically, any nests within 660 feet of activities that may cause nest disturbance (i.e., vegetation clearing and construction) may require that a take permit be issued for compliance with the Bald and Golden Eagle Protection Act. Additionally, nests from 660 feet to 0.5-mile from construction activities would be monitored by a qualified biologist. If resident birds appear disturbed by construction activities, construction activities would cease until young have fledged. If nests of other raptor species are found, USFWS would be contacted and construction activities would be monitored within the appropriate species-specific spatial buffer around the nest location.
- The FAA's standard protocols for the treatment of unanticipated cultural (historic, archaeological, etc.) discoveries during construction would apply. These protocols include measures for stopping construction if discoveries are made; having qualified archaeologists or other appropriate professionals examine the discovery; and consultation by the FAA with the State Historic Preservation Officer (SHPO), the ADOT&PF, federally recognized tribes, and other parties as relevant to the specific nature of the discovery [FAA Order 1050.1E, 11.5b(3)].
- Should an alternative with significant impacts on customary and traditional practices and cultural identity be selected for construction, the FAA would execute a Memorandum of Agreement (MOA) with the affected parties, as represented by the federally recognized tribal governments of the Sun'aq Tribe of Kodiak, the Native Village of Afognak, and the Tangirnaq Native Village, to stipulate appropriate mitigation measures.
- Caution would be required in areas of known hazardous materials contamination (such as Area 2 adjacent to Runway 18/36, or the former Snow Removal Equipment Building (just west of Runway end 18) if they are used for staging construction equipment and materials, or for construction haul routes. No excavation should take place in or adjacent to these areas. The Engineer would consider the use of contaminant screening devices, such as air/vapor monitors, if work is conducted in areas of known or suspected contamination.
- Construct fill areas in marine waters during low tide periods of the day.

- Fill materials would be obtained from existing permitted sources if possible (along road system, if possible) and would be clean (i.e., contain minimal fine particles such as silt and clay) to minimize sediment releases and turbidity outside of the fill zone.
- Armor rock would be evaluated to assure compatibility in the marine environment, (as determined by geochemical tests for pH or other acceptable protocol) thereby facilitating rapid recolonization of the outer fill materials by marine species.
- Conducting all work in accordance with permit stipulations (i.e., Corps 404 Permit, Title 41, Section 10 Rivers and Harbors Act permit, Title 41 (fish habitat) permit, and State Consistency Determination).

Construction Best Management Practices. The following or similar BMPs would be employed during construction. BMPs are activities relatively common in construction that can help to prevent pollution, minimize environmental harm, and assure that appropriate response action is taken if unacceptable environmental impacts occur, such as during a fuel spill. This list would not be completed until a construction management plan is prepared for the project permits.

- A construction stormwater pollution prevention plan and a construction oil spill prevention plan would be prepared to avoid or minimize discharges of sediment or hydrocarbons during construction.
- Ground disturbance areas including runway ends would require appropriate erosion and sediment control during construction. Design drawings would include an erosion and sediment control plan with the bid package.
- Potential for fuel, oil, or hydraulic fluid spills or leakage from construction equipment would be minimized.
- Performing fueling and maintenance of vehicles offsite or at designated areas.
- Fueling or servicing vehicles or equipment at least 100 feet from any wetlands or waters of the U.S. with the exception of low-mobility equipment.
- Development of a hazardous materials control plan.
- Use erosion control techniques such as sediment fences, straw bales, straw wattles, diversion terracing, inlet protection, and stabilized construction entrances.
- Use turbidity curtains to reduce sediment releases into marine waters.
- Placement of rock armor along fill edges as soon as it is feasible.
- Store construction equipment and material stock piles as far away from water bodies as practical.
- Development of a Spill Prevention, Control, and Countermeasure Plan (SPCC) to ensure potential pollutants are controlled and contained on site.

- The contractor would prepare a contaminant monitoring plan for excavation and ground disturbance work because the former military and ongoing aviation activities that have occurred in the Project Area raises the possibility that undocumented areas of contamination may be encountered during excavation activities.
- If contaminants are encountered or suspected, contractors would be required to stop work and, if possible, verify the type and extent of contamination. Appropriate authorities would be notified of the presence of contamination.
- If a spill of potentially hazardous substances occurs during construction, the appropriate authorities would be notified.
- Confinement of construction activities to the minimum area necessary to complete the project in order to reduce soil disturbance areas.
- Barge ballast water would be free of invasive species in accordance with the National Invasive Species Act of 1996 and Alaska Statute 46.03.750, *Ballast Water Discharge*.
- Minimizing soil and vegetation disturbances during the period of construction.
- Minimizing soil, gravel, and debris along haul routes between the Airport and the rock fill sources.
- Use of dust prevention measures along construction roads and stockpiles.
- Surface routes used for transport of materials to the Airport or the movement of construction equipment would be selected to minimize noise and traffic conflicts in residential areas and other areas with sensitive receptors.
- Using weed-free native seed in areas where re-vegetation is required, minimizing surface disturbance in areas of native vegetation that are to be maintained, use of fill material that is free of invasive plant species, and weed surveys and control before surface disturbing activities begin in order to minimize the spread of weed seeds into non-weedy areas.
- Implement reclamation activities following ground disturbing activities to minimize conditions that facilitate weed establishment.
- All on-site construction activities would be conducted in accordance with FAA Advisory Circular (AC) 150/5370-10F, *Standards for Specifying Construction of Airports* and FAA AC 150/5320-5C, *Surface Drainage Design*.
- Construction would be phased, limiting the added barge traffic in the area during the placement of fill materials.
- Construction barges would be scheduled to minimize potential impacts on the United States Coast Guard (USCG) and other vessels in the area.
- Construction lights would be directed away from the runway and other aircraft operation areas and may need to be shielded, if construction takes place while the Airport is open to air traffic.

6.6 Compensatory Mitigation

"Compensatory" mitigation is a method for offsetting impacts that cannot be avoided or minimized. These offsets may take many forms, such as replacement of habitat types lost, preservation of other (typically similar) habitats at risk, or even funding to support local or area mitigation needs. This section describes compensatory mitigation considerations applicable to the Kodiak Airport project, and outlines a proposed process to develop a conceptual compensatory mitigation plan. The ADOT&PF may use the conceptual planning process included with this Draft EIS as a basis for a final compensatory mitigation plan to be submitted with project-specific permit applications. The compensatory mitigation plan will be developed by ADOT&PF with agencies' input to create a final plan that is submitted in order to secure permits prior to construction.

Compensatory mitigation for the Kodiak Airport project would involve a number of State, Federal, and Local agencies because of specific and overlapping regulatory authorities. Typically, however, mitigation planning and approval is done in concert with and through the Army Corps of Engineers (ACOE), which has permit authority over areas where the proposed actions would impact marine waters of the U.S./wetlands under section 10 of the Rivers and Harbors Act, the Clean Water Act, or both. Mitigation requirements are generally applied as conditions for permit approval. The FAA may also assign mitigation requirements in its Record of Decision (ROD) approving one or more of the alternatives. Furthermore, mitigation including conservation measures may be developed through the application and permitting process for the use of Refuge lands.

The ACOE provides direction in Regulatory Guidance Letter (RGL) 09-01 for the mitigation of resources under its jurisdiction that would be adversely affected or lost as a result of a permitted activity. Within the framework of this RGL, the ACOE Alaska District may decide how: 1) adversely affected resources would be accounted for, in terms of resource function and value, and 2) credit would be assigned for specific types of mitigation. Factors used in making these determinations include habitat types affected, amount and locations of habitat, similarity of the habitat affected versus that proposed for establishment, restoration, enhancement or preservation, and mitigation timing and many other criteria.

Although the ACOE and other agencies have historically requested or prioritized, when possible, "on-site and in-kind" resource compensation (meaning, similar or equivalent habitat establishment or restoration in close proximity, such as within a watershed, to that being adversely affected or lost) these decisions are made on a case-by-case basis. This is an important consideration for any compensatory mitigation that may be identified for Kodiak Airport.

A concern specific to airports is the attraction of a mitigation property to hazardous wildlife, (i.e. those that could endanger aviation operations). FAA AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, addresses the issue of siting certain land uses that are incompatible with safe airport operations because they attract hazardous wildlife. Wetlands are generally considered incompatible with safe airport operations because they attract wildlife, including many species commonly involved in aircraft-wildlife strikes.

As a result, the FAA recommends that wetland and other types of mitigation projects that may attract hazardous wildlife be sited at least 10,000 feet from airports that serve turbine-powered aircraft, such as Kodiak Airport. In addition, a distance of five statute miles separation is recommended if the wildlife attractant (i.e., wetlands) may cause hazardous wildlife movement into or across the approach or departure airspace. The ACOE has incorporated FAA's siting criteria into their RGLs, and in the ACOE and Environmental Protection Agency (EPA) regulations on compensatory mitigation.

6.7 Outline for a Conceptual Compensatory Mitigation Plan

The following outline for a conceptual mitigation plan was developed by the FAA based on current regulatory requirements and guidance, and the environmental impacts associated with the preferred alternatives. Permit applications and the proposed mitigation plan will be submitted to the applicable agencies after public comment on the Draft EIS is complete.

An introductory section would be used to summarize the events leading up to development of the plan, including a description of the proposed actions and preferred alternatives, and preparation of the EIS to determine, in part, unavoidable impacts requiring compensatory mitigation. All efforts taken to identify appropriate compensatory mitigation would be described, including meetings with agencies and other relevant parties, and research into the various sites, projects, and other opportunities considered.

A section of the introduction would describe the applicable regulatory framework under which the mitigation plan is developed and would be reviewed. State, Federal, and Local agencies with formal roles in plan review and consultation, and permit review and approval, would be identified. A summary of the proposed compensatory mitigation would also be provided in the introduction.

The mitigation planning process used for this project would follow the steps identified in *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule*, promulgated as 33 CFR Parts 325 and 332 for the ACOE, and 40 CFR Part 230 for the EPA. The process outlined in the Final Rule is most directly applicable to compensatory mitigation for impacts to wetlands and in watersheds, but the essential principles of mitigation planning and steps for implementation are generally applicable to the Kodiak Airport RSA project. In general terms, compensatory mitigation should include 12 fundamental components:

1. Mitigation objectives
2. Site and project selection criteria
3. Site protection instruments
4. Baseline information about the airport area affected and the mitigation site
5. Determination of credits
6. Mitigation work plan
7. Mitigation maintenance plan
8. Ecological performance standards
9. Monitoring requirements
10. Long-term management plan
11. Adaptive management plan
12. Financial assurances

Each of the 12 components would be addressed as a function of the preferred RSA alternatives. However, most of the detail necessary for completion of the mitigation plan cannot be developed until further public input is received concerning the preferred alternatives.

All reasonable options identified by agencies, EIS staff, and other informed persons as candidates for compensatory mitigation would be described in the plan. These candidate mitigations would be evaluated based on screening criteria developed in consultation with the agencies.

The preferred alternatives would include measures to avoid environmental impacts, reduce adverse effects to the extent feasible, and ensure that residual environmental impacts are minimized.

Because the preferred alternatives would result in irreversible loss of regulated waters of the U.S. and impacts to the marine habitat, including submerged lands and resources of the Alaska Maritime Refuge, mitigation to replace and compensate for the losses may be required under multiple Federal and State laws and regulations. Specifically, the Clean Water Act and Section 10 of the Rivers and Harbors Act require that projects affecting waters of the U.S. mitigate for their impacts. Also, measures to minimize harm would be required under Section 4(f) of the Department of Transportation (DOT) Act.

Furthermore, federal and state agencies with responsibility for managing and protecting natural resources must be consulted with under the Fish and Wildlife Coordination Act and other statutes to ensure the preferred alternatives and the associated mitigation measures comply with established regulations.

Other federal agencies have recognized the unique circumstances that can apply to mitigation projects involving airports. In 2003, the FAA and EPA, USFWS, United States Department of Agriculture (USDA), Department of the Army (DOA), and U.S. Air Force (USAF) signed a MOA to address aircraft-wildlife strikes. The signatories to the MOA agreed that development of mitigation habitat that could attract hazardous wildlife to airports or nearby areas is one of three "activities of most concern" . The MOA encourages stakeholders of projects to develop land uses within the siting criteria of AC 150/5200-33B, referenced above. Further, the signatories agreed they will cooperatively review proposals to develop or expand wetland mitigation sites that may attract hazardous wildlife, and that when planning such sites, they will consider the siting criteria and land use recommendations of AC 150/5200-33B.

The above-referenced advisory circular and interagency MOA would not necessarily prohibit establishment, restoration, or preservation of *any* habitat within the general proximity to Kodiak Airport. For example, some methods to mitigate for lost or affected marine habitat would raise little or no concern with respect to wildlife aviation hazards. However, as the compensatory mitigation plan is developed and refined, all possible compensatory mitigation projects would be carefully evaluated to assure that no wildlife hazards to aviation would be created or supplemented.

TABLE 6-1
ENVIRONMENTAL IMPACT SUMMARY
IMPROVEMENTS TO THE RUNWAY SAFETY AREA – PREFERRED ALTERNATIVES

Impact Category	Runway 07/25 Alt. 2	Runway 18/36 Alt. 7	Combined Impacts
Coastal Resources and Navigation	Coastal Zone Management Act (CZMA) does not apply; Resource specific impacts are detailed in other resource sections.	CZMA does not apply; Resource specific impacts are detailed in other resource sections.	CZMA does not apply; Resource specific impacts are detailed in other resource sections.
Water Quality	Increase in impervious surface/stormwater runoff; no significant impacts expected; Moderate changes to sediment transport; moderate decrease in ability of Buskin River mouth to migrate. No significant impacts expected.	Increase in impervious surface/stormwater runoff. No significant impacts expected.	Increase in impervious surface/stormwater runoff; No significant impacts expected; moderate changes to sediment transport; moderate decrease in ability of Buskin River mouth to migrate. No significant impacts expected.
Wetlands and other waters of the U.S.	No fill into wetlands; 9.13 acres fill into marine waters; based on the magnitude of tidal waters loss, adverse indirect effect to maintenance of natural systems supporting fish habitat would result in significant impacts to waters of the U.S.	8.68 acres fill into marine waters; 0.11 fill into wetlands; based on the magnitude of tidal waters loss, adverse indirect effect to maintenance of natural systems supporting fish habitat would result in significant impacts to waters of the U.S.	17.81 acres fill into marine waters; 0.11 fill into wetlands; based on the magnitude of tidal waters loss, adverse indirect effect to maintenance of natural systems supporting fish habitat would result in significant impacts to waters of the U.S.
Floodplains	No fill into Buskin River floodplain	No fill into Buskin River floodplain	No fill into Buskin River floodplain
Fish and Invertebrates	Major loss of juvenile salmonid rearing and foraging habitat; major loss of salmonid prey species habitat; major changes to freshwater plume; moderate changes to sediment transport; moderate decrease in ability of Buskin River mouth to migrate; major potential localized changes to aquatic assemblages. Significant impacts to Fisheries Resources	Moderate loss of juvenile salmonid rearing and foraging habitat; moderate loss of salmonid prey species habitat; negligible changes to freshwater plume; negligible changes to sediment transport; negligible decreased ability of Buskin River mouth to migrate; moderate potential localized changes to aquatic assemblages. No significant impacts to Fisheries Resources	Major loss of juvenile salmonid rearing and foraging habitat; major loss of salmonid prey species habitat; major changes to freshwater plume; moderate changes to sediment transport; moderate decrease in ability of Buskin River mouth to migrate; major potential localized changes to aquatic assemblages. Significant impacts to Fisheries Resources

TABLE 6-1, CONTINUED
SUMMARY OF ENVIRONMENTAL IMPACTS, PREFERRED ALTERNATIVES

Impact Category	Runway 07/25 Alt. 2	Runway 18/36 Alt. 7	Combined Impacts
Waterbirds	Loss of small percentage of habitat in the Project Area for Steller's Eider (3.4%), Emperor Goose (3.4%), Pelagic Cormorant (2.8%), Black Oystercatcher (3.0%), Marbled Murrelet (2.3%). No significant impacts	Loss of small percentage of habitat in the Project Area for Steller's Eider (2.9%), Emperor Goose (2.9%), Pelagic Cormorant (2.0%), Black Oystercatcher (2.2%), Marbled Murrelet (2.0%). No significant impacts	Loss of small percentage of habitat in the Project Area for Steller's Eider (6.3%), Emperor Goose (6.3%), Pelagic Cormorant (4.8%), Black Oystercatcher (5.2%), Marbled Murrelet (4.3%). No significant impacts
Marine Mammals	Loss of small amount of marine mammal habitat (2.9%); N. Sea Otter Critical Habitat (3.5%) and Steller Sea Lion Critical Habitat (3.0%); No significant impacts due to small amount of area lost compared to total habitat, no significant impact on function or conservation role of affected critical habitat.	Loss of small amount of marine mammal habitat (2.8%); N. Sea Otter Critical Habitat (2.7%) and Steller Sea Lion Critical Habitat (2.4%); No significant impacts due to small amount of area lost compared to total habitat, no significant impact on function or conservation role of affected critical habitat.	Loss of small amount of marine mammal habitat (5.7%); N. Sea Otter Critical Habitat (6.2%) and Steller Sea Lion Critical Habitat (5.4%); No significant impacts due to small amount of area lost compared to total habitat, no significant impact on function or conservation role of affected critical habitat.
Terrestrial Wildlife and Vegetation	1.2% of the total cover impacted in the Project Area; No federally listed threatened, endangered species in the terrestrial project area; Indirect effects on Kodiak brown bear from reduced salmon runs. No significant impact on either special status species or non-listed species.	1.0% of the total cover impacted in the project area; No federally listed threatened, endangered species in the terrestrial Project Area; Indirect effects on Kodiak brown bear from reduced salmon runs. No significant impact on either special status species or non-listed species.	2.2% of total cover impacted; No federally listed threatened, endangered species in the terrestrial Project Area; Indirect effects on Kodiak brown bear from reduced salmon runs. No significant impact on either special status species or non-listed species.

TABLE 6-1, CONTINUED
SUMMARY OF ENVIRONMENTAL IMPACTS, PREFERRED ALTERNATIVES

Impact Category	Runway 07/25 Alt. 2	Runway 18/36 Alt. 7	Combined Impacts
Historical, Architectural, Archaeological, and Cultural Resources	No adverse effect on historic properties. There may be long-term, significant adverse effect on customary and traditional practices of the Sun'aq Tribe of Kodiak, Tangirnaq Native Village, and the Native Village of Afognak because marine and river resources that are traditionally harvested and subject to sharing, consumption, or other actions as part of cultural custom may be significantly impacted. Potential impacts would be greater under Alternative 3 than Alternative 2.	No adverse effect on historic properties. Short-term minor adverse effect on cultural customary and traditional subsistence practices and related cultural practices and identity of the Sun'aq Tribe of Kodiak, Tangirnaq Native Village, and the Native Village of Afognak.	No adverse effect on historic properties. There may be long-term, significant adverse effect on customary and traditional practices of the Sun'aq Tribe of Kodiak, Tangirnaq Native Village, and the Native Village of Afognak, because marine and river resources that are traditionally harvested and subject to sharing, consumption, or other actions as part of cultural custom may be significantly impacted.

TABLE 6-1, CONTINUED
SUMMARY OF ENVIRONMENTAL IMPACTS, PREFERRED ALTERNATIVES

Impact Category	Runway 07/25 Alt. 2	Runway 18/36 Alt. 7	Combined Impacts
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks	Socioeconomic impact on Kodiak residents who use subsistence resources (over 99% of the population). Equate to a decrease in approximately 1.4-2.7 pounds per user per year. Because almost all residents in Kodiak tend to use subsistence resources, the impact would affect nearly the entire population; therefore, there would not be any disproportionate impact to just one section of minority or low- income population relative to the use of subsistence resources. However, because subsistence resources affect take home resources for food, the reduction in subsistence resources per capita would likely be felt to a larger extent by low income populations because higher income populations could generally make up the difference in subsistence use through other resources (salary, etc.). Additionally, because subsistence practices are tied to the cultural identity of the Sun'aq Tribe of Kodiak, Tangirnaq Native Village, and the Native Village of Afognak, there could be a disproportionately high and adverse effect on customary and traditional practices and the cultural identity of those minority populations. Potential economic benefit from construction; No effects on children's health or safety. Potential impacts would less than under Alternative 3 due to greater impact on important habitat near the Buskin River for Alternative 3.	Potential impacts to subsistence resources would be avoided because it avoids fill into the Buskin River area, therefore avoiding the potentially significant subsistence impacts; Potential economic benefit from construction; No effects on children's health or safety.	Socioeconomic impact on Kodiak residents who use subsistence resources (over 99% of the population). Equate to a decrease in approximately 1.4-2.7 pounds per user per year. Because almost all residents in Kodiak tend to use subsistence resources, the impact would affect nearly the entire population; therefore, there would not be any disproportionate impact to just one section of minority or low- income population relative to the use of subsistence resources. However, because subsistence resources affect take home resources for food, the reduction in subsistence resources per capita would likely be felt to a larger extent by low income populations because higher income populations could generally make up the difference in subsistence use through other resources (salary, etc.). Additionally, because subsistence practices are tied to the cultural identity of the Sun'aq Tribe of Kodiak, Tangirnaq Native Village, and the Native Village of Afognak, there could be a disproportionately high and adverse effect on customary and traditional practices and the cultural identity of those minority populations. Potential economic benefit from construction; No effects on children's health or safety.

TABLE 6-1, CONTINUED
SUMMARY OF ENVIRONMENTAL IMPACTS, PREFERRED ALTERNATIVES

Impact Category	Runway 07/25 Alt. 2	Runway 18/36 Alt. 7	Combined Impacts
Subsistence	Some loss of immobile subsistence species and temporary displacement of mobile subsistence species during fill placement. Subsistence users would be displaced to other nearby marine areas to gather resources, which would likely increase competition for subsistence resources in those locations. Potential significant long-term impacts to abundance and availability of subsistence resources. Effects on abundance and availability in the affected important freshwater plume habitat because of potential for increased mortality of salmon smolts and, subsequently, returning adult salmonids. Effects are less than Alternative 3 due to smaller size of fill footprint.	No significant impacts due to lower use of area south of Runway end 36 by subsistence users and lower relative importance of habitats in this area relative to subsistence species. Placement of fill at Runway end 36 would displace a known herring congregation area.	Same as described for Runway 07/25 Alt 2 with added impact on lower quality resources near Runway end 36; Significant impact; 18.1 acres impacted of the Subsistence Use Area (1.0% in Subsistence Use Area) from fill on freshwater-influenced habitats.
Noise	No change in number of operations, location of operations or the resulting noise contour; no noise sensitive uses in the 65 DNL contour; no effect on Buskin River State Recreation Sites, Alaska Maritime National Wildlife Refuge, or Finny Beach. No significant impacts.	Slight shift in runway threshold; no noise sensitive uses in the 65 DNL contour. No significant impacts.	Since there is no change with Runway 07/25 Alt.2, there would be no combined impact from Runway 07/25 and Runway 18/36 Alternatives.
Compatible Land Use	No significant noise impacts; required lease amendment.	No significant noise impacts; required lease amendment; required modification to avigation easements.	No significant noise impacts; required lease amendment; required modification to avigation easements.

TABLE 6-1, CONTINUED
SUMMARY OF ENVIRONMENTAL IMPACTS, PREFERRED ALTERNATIVES

Impact Category	Runway 07/25 Alt. 2	Runway 18/36 Alt. 7	Combined Impacts
DOT Act Section 4(f)	Buskin River State Recreation Site : No physical use. Fishermen in the vicinity of the Airport would likely notice a long-term, measurable decline in salmonid abundance, with the result that the value of the Buskin River State Recreation Site in terms of its significance and enjoyment for sport fishing would be substantially reduced, thereby resulting in a constructive use. Alaska Maritime National Wildlife Refuge: Physical Use of 9.1 acres. National Historic Landmarks: De-minimis impact; no adverse effect on historic properties.	Buskin River State Recreation Site: No use. Alaska Maritime National Wildlife Refuge: Physical Use of 8.7 acres. National Historic Landmark: De-minimis impact; no adverse effect on historic properties.	Buskin River State Recreation Site: Constructive use may occur relative to fishing due to potential reduction in abundance and availability of salmonids. Alaska Maritime National Wildlife Refuge: Physical Use of 17.8 acres. National Historic Landmark: De-minimis impact; no adverse effect on historic properties.
Light Emissions and Visual Impacts	Moderate short and long-term visual impacts. No significant lighting impacts.	Major short-term visual impacts; minor long-term visual impacts. No significant lighting impacts.	Major short-term impacts; long-term impacts would be minor to moderate. No significant lighting impacts.
Hazardous Materials, Pollution Prevention, and Solid Waste	No disturbance of known contaminated sites that have not been cleaned up; no substantial waste generated. No significant impacts.	No disturbance of known contaminated sites that have not been cleaned up; no substantial waste generated. No significant impacts.	No disturbance of known contaminated sites that have not been cleaned up; no substantial waste generated. No significant impacts.
Farmland	No prime or unique farmland impacted.	No prime or unique farmland impacted.	No prime or unique farmland impacted.
Natural Resources and Energy Supply	256,932 cubic yards (cy) of fill; Small increase in fuel and electric use; No significant impacts.	462,081 cy of fill; Small increase in fuel and electric use; No significant impacts.	719,013 cy of fill; Small increase in fuel and electric use; No significant impacts.

TABLE 6-1, CONTINUED
SUMMARY OF ENVIRONMENTAL IMPACTS, PREFERRED ALTERNATIVES

Impact Category	Runway 07/25 Alt. 2	Runway 18/36 Alt. 7	Combined Impacts
Air Quality	No change in number of aircraft operations; Small short-term increases in emissions from construction; No significant impacts.	No change in number of aircraft operations; Small short-term increases in emissions from construction; No significant impacts.	No change in number of aircraft operations; Small short-term increases in emissions from construction; No significant impacts.
Climate	No change in number of aircraft operations; Small short-term increases in emissions from construction; No significant impacts.	No change in number of aircraft operations; Small short-term increases in emissions from construction; No significant impacts.	No change in number of aircraft operations; Small short-term increases in emissions from construction; No significant impacts.
Wild and Scenic Rivers	Project Area does not include any designated wild and scenic rivers, study rivers, or otherwise eligible rivers.	Project Area does not include any designated wild and scenic rivers, study rivers, or otherwise eligible rivers.	Project Area does not include any designated wild and scenic rivers, study rivers, or otherwise eligible rivers.
Construction Impacts	256,932 cy of fill; Air, water, noise, and surface transportation impacts from construction that would be temporary and not significant due to use of BMPs and avoidance/minimization measures.	462,081 cy of fill; Air, water, noise, and surface transportation impacts from construction that would be temporary and not significant due to use of BMPs and avoidance/minimization measures.	719,013 cy of fill; Air, water, noise, and surface transportation impacts from construction that would be temporary and not significant due to use of BMPs and avoidance/minimization measures.
Secondary (Induced) Impacts	No shifts in patterns of population movement or growth; No permanent changes in economic activity; Primary effects result from induced effects from significant impacts to fisheries, associated subsistence and cultural practices.	No shifts in patterns of population movement or growth; No permanent changes in economic activity; No significant impact on fisheries or resulting induced impacts due to avoidance of Buskin River.	No shifts in patterns of population movement or growth; No permanent changes in economic activity; Primary effects result from induced effects from significant impacts to fisheries, associated subsistence and cultural practices.